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Exploring the Risk Management Practices of the Metropolitan, Municipal and District Assemblies in Construction Project Delivery

By

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DECLARATION

I hereby declare that this submission is my own work towards the MSc Construction Management and that, to the best of my knowledge, it contains no material previously published by another person, nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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ABSTRACT

Risk management is now a readily recognised component of the management discipline; its application though is not always recognised. This usually becomes much of a problem for managers of public institutions who have the enormous task of making sure that the available scarce resources are used diligently in the most efficient and effective manner to deliver quality to the people. The aim of the study was to explore the risk management practices of the Metropolitan, Municipal and District Assemblies (MMDAs) in the execution of construction projects. The specific objectives of the study were: to find out whether MMDAs plan for risk in the execution of construction works; to identify ways the MMDAs respond to construction project risk; and to identify the difficulties involved in project risk management in the MMDAs. The primary data for the study were obtained through questionnaire, administered to the respondents. Data collected were analyzed, using frequencies, percentages and relative importance indices which were aided by Statistical Package for Social Sciences (SPSS). The results of the study indicated that misinterpretation of user"s needs, unnecessary delay in payment of retention money for contractors and evaluation panel members not qualified were risk factors most responded to by avoiding their occurrence. Inadequate/misleading information in tender documents, pollution and cash flow difficulties (Contractor) were also most responded to by „mitigation". Contractor"s withdrawal of tender after closing date for opening of tenders and contractor"s refusal to go to site after taking advance payment were risk factors most responded to by „transfer". Influence by political figures in deciding locations for public projects, change of government and inclement weather were best responded to by „acceptance". Through this work, it has been realized that more work needs to be done especially on the development of a framework for project risk management at the MMDAs. It is thus recommended that, the local government service secretariat should organize training workshops on risk management for project actors in the MMDAs; the MMDAs should be allowed to work independently devoid of political interference; equal priority should be given to project risk management and future research efforts in risk management should be tailored towards the development of a framework for the management of project risks at the MMDAs. **Key words**: Risk, Risk Management, Risk register, Risk plan, Risk response strategies, Avoid, Mitigate, Transfer, Accept.

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LIST OF ABBREVIATIONS

RMP	- Risk Management Plan
PM	- Project Manager
PDT	- Project Design Team
R&D	- Research and Development
PRMT	- Project Risk Management Team
ERM	- Effective Risk Management
CCO	- Contract Change Order
GBE	-Government Business Enterprises
MMDA‟s	- Metropolitan, Municipal and District Assemblies
MDA‟s	- Ministries, Departments and Agencies
DFR	- Department of Feeder Roads
GHA	- Ghana Highways Authority
WBS	- Work Breakdown Structure
RAMP	- Risk management and assessment practices
RII	- Relative Importance Index
PPCC	- Public Procurement Conditions of Contract
DPCU	- District Planning and Coordinating Unit
VECP	- Value Engineering Change Proposal
JRM	- Joint Risk Management

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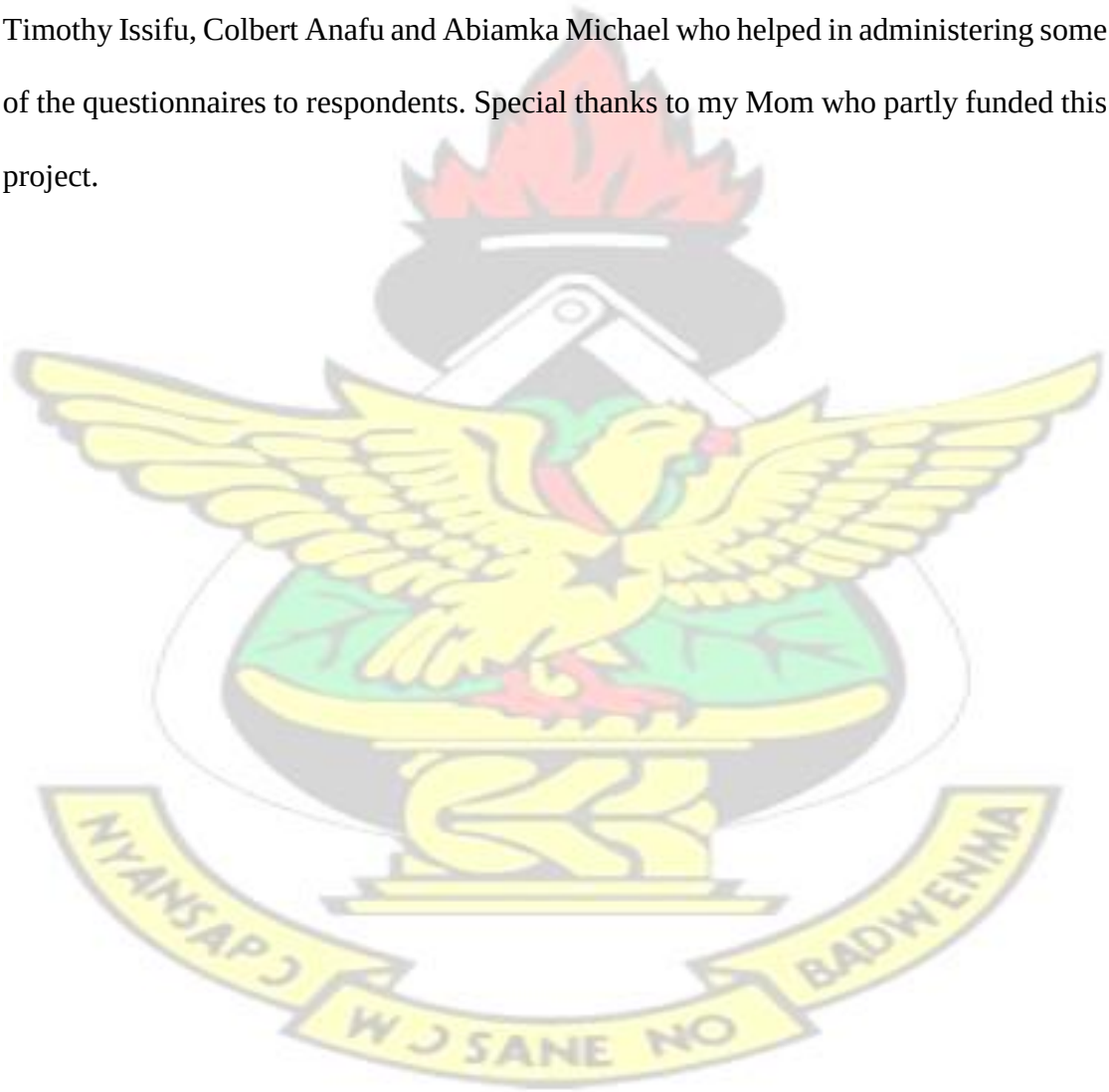

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Risk management in all its forms is now a readily recognised component of the management discipline. Its application though is not always recognised. It is also important to recognize that there is no business or venture that exists as being free of risk. Every step that we take in what we do there is always some form of risk to guard against. This usually becomes much of a problem for managers of public institutions who have the enormous task of making sure that the available scarce resources are used diligently in the most efficient and effective manner to deliver quality to the people concerned. In view of this, it is extremely important that public institutions rely not only on their perceptions in handling risk affairs, but considers the use of expert and recognized management procedures for handling risk as an essential part of the institutions daily management procedures (The European Academy for Taxes, economics & Law, 2015).

There are organizations that have well established departments to deal with risk that they may be exposed to or face. Professionalized risk management allows organizations to deal with risks in the open and improve communication with all stakeholders involved (The European Academy for Taxes, economics & Law, 2015). The use of risk management tools and risk control measures enables public authorities to make good decisions based on planned risks and increases the focus on accountability. Risk management tools and risk control measures when used effectively also support the organization‟s management to carry out their responsibilities well and certainly will result in the accomplishment of its planned objectives and thus bring about a more effective and well-organized audit functions without unnecessarily increasing the

bureaucracy that exists out of proportion. A real increase in value is achieved in terms of quality, effectiveness in the work of public organizations.

Risk is defined simply by McPhee (2005) as the improbability involved in achieving the institutional objectives. Pieplow (2012) also defined risk as an "uncertainty" that matters. He continued to argue that the uncertainty may be about an event in the future that has the probability of occurrence and the unknown degree of the likely impact on the objectives of the project if it occurs. This means that risk could be seen as an event that has a probability of happening, and could have either a positive or negative influence to a project should it happen. Hence risk is most of the time categorized by its probability of occurring and the accompanying impact. This is often understood as the "severity" of the risk if it does occur, and it is the product of impact and the probability. Federal Aviation Administration of the United states Department of transportation (2009), paper on risk has it that analysis of risk management yields many definitions, but is quick to admit that risk management is a practical approach to managing uncertain events. Risk assessment is therefore a measureable value that is given to a task, action, or event. When well-equipped with the predicted valuation of an activity, owners are able to manage and mitigate their risk. Risk management is thus a decision-making process intended to identify hazards, assess the degree of it, and determine the best option to deal with it. Once risks are identified, they must be assessed. The risk assessment process determines the degree of risk (i.e. Negligible, low, medium, or high) and whether it is worth the outcome of the activity planned. If the degree of risk is at acceptable levels then the planned activity may then be undertaken. Once the planned activity starts, consideration must then be given whether to continue (Federal Aviation Administration, 2009).

The pertinent question one would ask is why risk management in public institutions notably the Metropolitan, Municipal and District Assemblies (MMDA"s)?, Cooper (2010) acknowledges that the concept of risk has captured a growing interest in modern societies, shedding light on the public"s desire for safer foods and drugs, a cleaner environment, and safer products alongside higher living standards. Risk management thus indicates the desire to develop decision making under uncertainty and to make maximum use of the benefits and to reduce the costs involved. KPMG (1999) as cited in Cooper (2010) also admits that there are numerous benefits that can be gotten from the implementation of risk management practices some of which help achieve the objectives of the organization, enables managers to focus their resources on the primary objectives, improved financial and operational management by making sure that risks are adequately provided for in the decision-making process, reinforcement of the planning process and also a way to aid management identify opportunities and threats that may hinder the objectives of a particular project.

1.2 STATEMENT OF THE PROBLEM

Risk management should be regarded as a vital tool for organizations with more emphasis on public institutions seeking to achieve efficiency, value for money and increase production capacity. The real issue here then is does the MMDAs practice risk management in the execution of construction works? It is a common thing in Ghana to see heavy construction projects with high initial capital left to their fate half way into the construction, whilst other projects although almost at completion level are abandoned. Those that get through to completion stage and commissioning are sometimes met with little use. Other brilliant infrastructural developments earmarked for rural communities remain and expire on bill boards. One finds it difficult to comprehend whether public institutions really consider that these projects can face

unforeseen challenges and that these challenges or perceived difficulties have the capability to throw the project objectives over board, so the need to plan for unforeseen circumstances that may arise as supported by Guta (2012).

These construction projects that are left abandoned are funded from public accounts. These are funds that are supposed to be used to provide development for the people and it is a fact that resources are scarce and therefore, it is disheartening to see huge proportions of these resources invested in a construction project that may not get completed to serve the purpose for which it was accepted. Resources once used cannot be retrieved. According to Nadeem *et al.* (2010), we need to realize that the way we do things are becoming more hectic in today"s social environment and it is more evident in industry where products are ever increasing in complexity and the fast emergence of new technologies. A lot of new ways of doing things in the construction industry have come up and these new technologies harbor inherent uncertainties that can create problems for us. The human as a social being attempts to interact amidst this more complex and chaotic environment (Tetteh, 2014).

The fact is that now we are more educated than we used to be, but we still have our original biological fundamentals as before. So as a result of this, risks today present a more unmanageable and unpredictable situation within a construction project and the organization as a whole. But in the face of all these, our ability to identify and react to project risk is imperative especially when we are being entrusted with public resources. The absence of interest in project risk management in public institutions has affected some public projects costing a lot of money. It is against this back drop that the exploration into the risk management practices of MMDAs in construction project delivery is carried out.

1.3 AIM

The study seeks to explore the risk management practices of the MMDAs in the execution of construction projects.

1.4 OBJECTIVES

In achieving the aim of the study the following objectives were advanced:

1. To find out whether the MMDAs plan for risk in the execution of public Works;
2. To identify ways the MMDAs respond to construction project risk; and
3. To identify the difficulties involved in project risk management in the MMDAs in Ghana.

1.5 SCOPE OF THE WORK

Risk management itself is one very broad area to deal with having so many branches, but the scope of this study was limited to the risk management culture of some public institutions in construction project delivery. The research setting was limited to the Metropolitan, Municipal and District Assemblies (MMDAs) of the local Government system in Ghana. These are the highest decision making bodies of the decentralized system at the grassroots and are mandated by law to exercise political and administrative authority in the district and be responsible for the overall planning and development of the district. They also take responsibility for the development and improvement of basic infrastructure at rural areas (Local Government ACT 1993 (ACT 462).

1.6 JUSTIFICATION FOR THE STUDY

It is an undisputable fact that in every region of the Country one would find a number of uncompleted projects that one ponders hard to understand the difficulties that have led to the fate of those projects. Some projects have been completed but are met with

little use because there could have been a lack of stakeholder involvement to say. Risk identification and assessment during the conceptual stages of a project is extremely important as indicated by Pieplow (2012). It enables project Managers manage and control risk when they occur in construction projects. If this is not done, there is the possibility of project failure which could have been avoided. Risk management in construction projects delivery is therefore essential especially for the MMDAs that have been entrusted with public resources for the provision of infrastructure. The aim and objectives of the study as outlined above sets the difference between this research work and previous Works by others. This study seeks to add something new to the already existing knowledge on risk management practices of Public institutions by looking at the MMDAs.

1.7 RESEARCH METHODOLOGY

The collection of data included primary and secondary sources. The primary data was obtained through administration of questionnaire, personal observations and with people who were interested and or have knowledge on the subject matter from the MMDAs in the Northern and Upper East Regions of the country. The secondary data was gathered from review of the existing literature in books, Journals and the internet etc. Purposive sampling technique was used to select the participants targeted for the study. Quantitative data was obtained from the use of well-structured questionnaire administered. Quantitative data involves values measured numerically. The data collected was analyzed, using the appropriate statistical tools such as frequencies, percentages, relative importance indices which were aided by Microsoft excel and SPSS. Recommendations from the findings were giving appropriately.

1.8 STRUCTURE OF THE STUDY

The study was organized into five (5) main chapters. Chapter one included; an introductory background to the study, problem statement, aims, objectives, scope of the study, justification for the study and research methodology. Chapter two also presented a review of the necessary literature. Chapter three contained the research methodology used, Chapter four examined in detail the data collected and Chapter five then delivered carefully, the summary, conclusion and recommendations of the study.

CHAPTER TWO LITERATURE REVIEW

2.1 INTRODUCTION

Risk is generally a part of every human enterprise. From the moment we get up in the morning, drive or take public transportation to get to school or to work until we get back on our beds, we are exposed to risks of different degrees. The most attractive thing about the study of risk lie in the fact that some of these risk-bearing activities may not be caused intentionally but some risk-bearing activities are sought after by humans. Example is when one decides to over speed on a highway or takes part in playing games just to make merry out of them. While some of these risks may appear insignificant, others create a major difference in our way of living. When an entity is entrusted with public resources then there is the need to plan against risks events that can unmake the very objectives of the institution. The aim of the study was to explore the risk management practices of the MMDAs in the execution of construction projects.

2.2 RISKS IN CONSTRUCTION INDUSTRY

Tetteh (2014) who hitherto shared his views that construction projects all over the world are capital intensive in nature requiring an enormous investment of financial, human and capital resources. This makes the study of risk management in public procurement very important. Construction companies and the public sector specifically public institutions in Ghana are usually faced with different kinds of construction project risks some of which include; environmental issues, political, social and economic risks in project implementation (Tetteh, 2014). Danquah (2014) accepted that the public sector is often described to operate at organizational and project level much different compared to that of the private sector. Relative to their private sector counterparts, the operating environment is one in which objectives and/or mission statements tend to

change as per the changes in the governing political agenda and Departmental funding decisions are often influenced by competition for funding, lack of available resources and compromise across various departments.

Nadeem et al. (2010) in his research paper on risk management in construction industry, accepted the fact that the construction industry is one area where the likely occurrence of risk events is certain, with complex and ever changing project environments. The industry is very vulnerable to several kinds of risks which may be business-related, technical, and socio-political in nature. The construction industry has no good track record of being able to cope with these types of risks. For this reason, the workers in the construction industry bear various degrees of failures some of which include; failure to simply abide by requirements such as quality and operational, cost overruns and then unlimited delay in the completion of the project. In the face of all this, it can be confidently concluded that an effective system of assessing risk and its management for construction industry still remains a very huge task for the practitioners in the industry. Klemetti (2006) agrees that Construction projects have a bad name of failing to meet the deadlines and cost targets set, which is why identifying risk sources in the construction sector, is of great importance. Odeh and Battaineh (2002) made extensive studies on the typical reasons why construction project delays in the far-east. They came out with seven substantial reasons for project delays: interference of owner, inadequate experience of the contractors, financing and payments problems, challenges with labour productivity, inadequate project planning and challenges posed by subcontractors and suppliers.

Also, the public sector is often regarded as slow moving, rigid, operating in an environment of ever changing priorities directed by political masters and responding to multiple stakeholders in hierarchical institutional management However, most of Public

institutions do not plan for risks when bids and tenders are being considered for construction projects. Construction risks are normally seen as events that have an effect on the overall project objectives basically, cost, time and quality. It is possible to foresee or recognise some of the risks that are associated with the process of construction; though others can be entirely unpredictable (Al-Bahar *et al*, 1990). The Construction industry itself is characterized by a lot of challenges, wastage of both materials for construction and the necessary human resource to handle affairs. This gives rise to construction projects being completed way over budget, and completed a period beyond the project completion date. The quality components of these projects are usually heavily compromised in this regard. All these challenges lead to projects being neglected or abandoned during the construction stages and some others that have been completed are sometimes met with little or no use. Flanagan and Norman

(1993) and also Akintoye and MacLeod (1997) Smith (2003) as cited in Nsobila (2014) made a strong argument that the construction industry is subject to more risks compared to many other industries because the industry possesses unique features coming from various construction activities and some of which are long working periods, complex processes, terrible environment, financial intensity and dynamic organization structures.

Nsobila (2014) continued that the situation is more prevalent in Ghana where the construction industry is largely characterised by non-adherence to standard construction practices, sub-standard specification for building works, a greater number of the workforce being illiterates, owners wanting to have a full control of all parts of the project, non-availability and no regard for timely release of funds for construction works and political interference especially with public works. The procurement of construction work in Ghana is usually bedevilled by so many uncertainties and the

mismanagement of these uncertainties could lead to the compromise of very important project objectives. The most important question one would ask would be whether these uncertainties are planned for and if they occur how they would be handled to ensure that the aim of the construction project and its objectives are not affected. Tetteh (2014) in his project report had it that the procurement of these important infrastructure is surrounded by a lot of risk and asserts that the identification of these risks, the extent and the degree of severity, should they occur, have an effect on the success of the procurement of the work. It was therefore very necessary to identify the risk management procedures used in the procurement of works in the public sector of Ghana.

2.3 CHARACTERISTICS OF THE PUBLIC SECTOR

According to the International Federation of Accountants (2011), the public sector encompasses national governments, local government units Sub-national governments, and regulatory bodies. The public sector also embodies a number of entities with differing structures and governance arrangements. These entities include Government Business Enterprises (GBEs) which are also known as public corporations. GBEs and private sector corporations have comparable features, but these are rather governed by an entity from the public sector, which can be said to benefit directly from the activities of the GBE (International Federation of Accountants, 2011). These government businesses may be profit driven or have a latent objective to break even financially. Although non-governmental organisations known as NGO"s share many of their characteristics such as non-profit seeking with the public sector, they cannot be accepted as being part of the public sector. The nature of governments and other public sector entities and the environment in which they operate has implications for the concepts that underpin risk management requirements and treatment. There are usually some distinct features of the public sector that distinguishes it from the profit-making private

sector organisations and this therefore has some possible consequences on the development of a concept which will reflect public sector conditions, and the setting of risk standards for the public sector (International Federation of Accountants, 2011). Guta (2012) defined public administration as a good depiction of procedures put together and management relations which exist amid the constituents of a strong managerial system through which, in a public control, the laws are enforced and the activities in the effective deliverance of services that satisfies the public interest are planned, coordinated, organized, supervised and managed. She continued to emphasize that the effective administration of the public sector comes with a set of management procedures and connections that happen between the components of the administrative system and that public management objective is to satisfy the interest of the public by having an appropriate institutional framework created, and which allows the application of acts that deals with norms or laws in accordance with circumstances of judgments, ordinances and guidelines. Guta (2012) however, had some reservations that going beyond the issues of rationalization and the impartial public sector management, especially taking into consideration the relationship between political figures and public sector workers, managing public sector affairs by these institutions is a great challenge in the light of soliciting more complex and valuable services on behalf of the citizens. The management of public affairs concerns the ability to figure out the problems about the whole community and looking for solutions that are required at the social level.

2.4 RISK PLANNING

2.4.1 Planning for Risk in construction projects

In his book on *Project Risk management Handbook (2012),* Bob Pieplow argued that the size of a project and its complexity together with the anticipated amount of risk management effort needed are key in determining whether a Risk Management Plan

(RMP) will be required or not. That responsibility falls on the project manager and the Project Design Team (PDT) to decide if it is required. He however, maintains that a risk management plan is very important as it determines how the project risk management will be performed and how often meetings shall be held for risk management and to be able to update the risk register. A risk management plan contains the list of the various professionals who form the risk management team and also a definitive budget for risk management activities. He continued to say that the risk management plan has to be ready during the project planning stages as it is a vital tool to ensuring successful performance of the project.

2.5 RISK MANAGEMENT

2.5.1 What is Risk

Risk is defined differently by different people depending on the type of endeavour one may be involved in. The underlining meaning though remains the same. According to Loosemore *et al.* (2006) as cited in Danquah (2014) at both industrial and organization levels, risk is perceived differently and this is mainly because different people harbour totally different views and understanding of a certain risk component, its source, probability, consequence if it occurred and the preferred action. The opinion of people, their attitudes, judgements and their feelings are believed to have a lot of influence on how risk is perceived. Cleden (2009) as cited in Nsobila (2014) also describes risk as the statement of what may possibly arise due to inadequate knowledge about a particular situation and continued to say those risks events constitute a gap in information and which make up a hazard to the objectives of the project.

Holton (2004) strongly argued that for risk to exist there needed to be two important ingredients present. First of all, there has to be uncertainty about the potential outcomes from an experiment. Secondly, the outcome has to be relevant to the issue for the benefit

of being useful. He notes, for example, that a person who decides to jump out of an aeroplane with no parachute faces no risk since he was certain of death (there is no uncertainty here) and comparing that to someone drawing balls out of an urn. This does not in any way expose the person to any form of risk because his/her health, finances or state of wellbeing has not been affected by whether the ball drawn has colour red or black from the rest. Nonetheless, the mere attaching of different financial values to each of the balls would have converted the activity to a risk event.

Panthi and Azhar (2010) alluded to the fact that in the construction industry, risk has always been a major cause of concern and that risks in manufacturing industries are better defined and therefore better managed compared to the construction industry. Klemetti (2006) asserted that though risk has been studied extensively as a subject, the definition of risk still lacks a clear and shared model: as more often risk is perceived to have an unwelcome and hostile significance. He continued to say that such a definition propagates two misleading views: first, between industry professionals and specialists, there is a well-known agreement that risks need to be regarded as having both positive and negative consequences that needs to be taken note of. Secondly, it is important to note that risk cannot be related only to events or single pockets of action. A risk can also be related to future conditions of a construction project. These conditions have the potential to become favorable or unfavorable. Fundamentally, the definition of risk commonly focuses on the negative consequences rather than the positive consequences as studied by Cabano (2004) and Baldry (1997) cited in Danquah (2014). Baldry (1997) further explained that for an event to be seen as a source of risk there must be a rational loss associated with it which came about as a result of this chance event. The scale of the loss suffered is referred to as the effect or impact of the risk. Here emphasis is laid

on the concept that risk is only associated with occurrences that have a negative consequence.

Gathering from the literature, a discrete occurrence that may affect the project for good or bad can be described as risk. Often unusual state of nature, characterized by the absence of any information related to a desired outcome. It is also very important that when considering risk one should be able to determine the likelihood of occurrence, the kind of consequences (is it a negative impact or positive one and how much is at stake?), expected time of occurrence in the project period and the total number of risk events anticipated from that particular source.

Nadeem et al. (2010) affirmed that common risk situations that are normally related to the construction industry can widely be grouped under the major headings presented below:

a) Risks that are technical in nature - which examples include insufficient site investigation, incomplete design, unsuitable specifications and uncertainty over availability of building materials;

b) Logistical risks - may include insufficient transportation facilities, availability of resources particularly construction equipment spare parts, fuel and labour;

c) Management related risks - Uncertain output of resources, industrial relations difficulties, and unpredicted behavior of workforce;

d) Risks associated with the environment – includes; unpredictable climate and seasonal changes, natural tragedies;

e) Financial risks - unstable foreign exchange, payment delays, inflation, local taxes; and

f) Socio-political risks - customs and import constraints and procedures, difficulties in disposing of construction plant and equipment and strong stand on the use of local firms and agents. According to Nadeem *et al.* (2010), common sources of risk in construction projects are:

1. Some changes in the scope of the project and other requirements that are contractual;
2. Ill-defined roles and responsibilities;
3. Inadequate skilled work force;
4. Subcontractors and suppliers;
5. Inadequate experience of contractors;
6. Uncertainty as regards to the fundamental relationships existing between the project actors;
7. New technology in the construction industry;
8. unfamiliarity with local conditions; and
9. Force majeure or „Act of God".

2.5.2 What is meant by Risk Management?

In order to be able to achieve important project objectives such as time, cost, quality, safety and environmental sustainability, it has been recognized that the management of construction project risks is key. But before now, most researchers had their focus narrowed to certain aspects of construction project risk management, rather than using a well-organized and all-inclusive approach to project risks identification and assessment of the impact as a result of their occurrence (Wang *et al,* 2012)

The management of risks differs from one context to the other as well as risk definition and also, the meaning of management in general as shown in the risk context, is gotten

from different viewpoints. Considering the basic level, the management of risk as given by Olsson is the activity of taking responsibility for, having a fair appreciation of, guiding, supervising, or more simply to be in-charge of risk (Olsson, 2006).

Risk management is a process of thinking thoroughly about all possible risks, problems or disasters even before they happen and setting up plans and procedures that will avoid the risk, or minimize its impact, or cope with its impact. It is fundamentally the setting up of a process where you can identify the risk and come up with a strategy to control or deal with it. It is also about making a genuine evaluation of the true risk level that is likely to develop in a project (Chapman, 1997 as cited in Tetteh, 2014). Tetteh (2014) further explained that risk management begins with three basic questions as listed below:

1. What can go wrong with the project?
2. What will we then do to prevent it?
3. What will we do if it happens?

According to Gajewska & Ropel (2011) risk management is still a concept that has become very popular in a number of businesses. It has come to his realization that many businesses most of the time institute risk management techniques in the implementation of their projects for better performance and profit maximization. They also agreed that construction sector projects are widely complex and most of the time come with very huge budgets and for this reason, the priority of everyone concerned project manager should be able to reduce the risks that come with these projects. Mehdi *et al.* (2012) in a journal of construction in developing countries posited that one of the vital issues that a project manager would have to deal with in construction project management is that of risk management. Risk management includes the identification of risk, the assessment of risk either by quantitative or qualitative means, choosing an appropriate

risk response strategy, and then effectively monitors and documents every risk. They continued to say that early identification of risks during the planning stage and a fair assessment of their relative importance, project managers can easily recognize methods used in reducing risks and assign the best people to handle them. Risk and for that matter risk management in construction has come of age and has taken a strategic position in construction project management that it can no longer be viewed only as a concept but a reality that can be assessed and measured. When it is ignored or disregard at project planning and design stages the resulting consequences as a result of the occurrence of these risks could be dire for project objectives.

It is interesting to note that a lot of explanations and definitions have been developed by researchers for risk and risk management. The difficulty here is which one presents us with the most reliable solution. Each of the authors who have contributed immensely to risk management provided us with how they perceive project risk and how it is managed. Any definition will usually be dependent on the project or the business type (Samson *et al.*, 2009). In general, management of risks is so wide a subject that it becomes very difficult to get one definition that can be applied across all industries.

2.6 THE RISK MANAGEMENT PROCESS

Professionalized risk management facilitates organizations to deal openly with risks and boosts effective communication with all stakeholders involved. The use of tools for risk management and control permits public institutions to come up with improved decisions founded on estimated risks. Risk when managed properly creates a real added value for the quality, productivity and effectiveness of the work of public institutions (European Academy for Taxes, Economics & Law, 2015).

The risk management process involves a carefully organized system where effective management policies and procedures are applied to tasks in order to establish the framework for the identification, assessing, analyzing, treating, monitoring and communicating risks that have occured (Cooper et al., 2005 cited by Gajewska & Ropel, 2011) as cited in Nsobila (2014). Pieplow (2012) also agrees that the establishment and cultivation of a culture of risk management is a basic requirement for the effective management of risks in an organization. In such a working environment, project teams complement each other‟s efforts throughout each phase of project delivery to effectively manage risks that may occur. The reason behind developing a risk management culture in the organization is to bring to the understanding of the project design team that their responsibilities are not only limited to the design of buildings, roads, bridges, drainage systems and many others but the management of risk is the responsibility of every member of the project team and there should be initiated accountability checks to make sure that there is effective management of project risk. All methodologies to the effective management of project risk try to improve and make it more efficient and effective.

Though the specifics of risk management processes may be different and which depends on the project type and nature, the three essential parts of risk management are, identification, analysis and action. To be able to properly manage risk, the identification of it as a first measure is very important, it then needs to be described, understood, and assessed properly. Analyzing the risk only may be sufficient but has to be followed keenly by the real action. It is important to note that a risk process which does not lead to application of actions necessary to deal with identified project risks is not complete and can be very useless. The final aim is to manage the risk, not simply to analyze it.

The process of managing project risk is not difficult at all, it offers basically a well-structured way to consider risks and how to deal well with it (Pieplow, 2012).

2.6.1 Risk identification

According to Al Bahar and Crandall (1990) risk identification may be defined as the process of consistently and endlessly identifying, categorising and evaluating the initial significance of risks associated with construction contracts. Risk assessment process therefore, starts with the identification of risk and risk classifications. An institution will most likely have a number of risk categories to evaluate and identify risks that are particular to the organization. What can possibly go wrong about the project? A more well-organized process involves using checklists of potential risks and evaluating the possibility that those events might materialize on the project (Nsobila 2014).

Pieplow (2012) also agreed that Risk identification brings to light what is likely to occur that can affect positively or negatively the objectives of the project and even how such events may occur. A deliverable is produced known as the risk register for the project and this document all possible risks events and their characteristics. This risk register that has been created is later on adjusted using either the quantitative or the qualitative analysis of risk, risk response strategies and also the process of monitoring risk. The risk identification process is a repetitive one since new risks may come up as the project progresses and the old ones may be dropped and others updated.

Banaitiene and Banaitis (2012) as cited in Tetteh (2014) strongly supports the idea that Risk identification is the foremost and possibly the most significant step in the risk management process, as it attempts to make a recognition of the causes and types of risks that could possibly disturb a construction project. It includes the recognition of possible risk events and the risk responsibilities. According to Wysocki (2004) Risk

identification is an iterative process that involves the project team, stakeholders and other managers affected by or who affect the project, and finally outside individuals who can comment on the completeness of the risk identification based on their similar experiences.

The concept of risk encompasses both negative and positive impacts. This implies that risk may be used to describe any uncertain event that may happen and would bring along a negative or damaging consequences. Equally, risk can also be used to describe uncertain events that when they occur will bring positive consequences. This leads us to two sides of risk. These are opportunities and threats. The greatest potential for opportunities in a construction project is at the project design stage since changes can still be made to the project. At this stage risk can be reduced drastically or avoided altogether by reviewing the feasibility and improvements that can be made to a project design, the construction methods, and materials that will be used. Once a design goes into the construction stage, the objectives of the project which are the time, quality, and scope are contractually fixed, so this means opportunities to save some money and time become fewer. If it becomes necessary to make some changes then it has to be effected with a Contract Change Order (CCO), and only a negative contract change order such as the one coming from the contractor‟s Value Engineering Change Proposal (VECP) would still yield some chance to make savings of money and time. If not, change orders bring about addition to the project time and cost. It is important that, the focus of risk management during construction should be to reduce risk or eliminate it outright (Pieplow, 2012).

2.6.2 Risk response strategies

According to Pieplow (2012) risk response has to do with developing options and determining actions to take that will enhance opportunities and reduce threats to the

project objectives. This process ensures that the identified risks are properly addressed. It is a widely accepted notion that the process of risk response commences with risk planning. This step involves mainly trying to figure out, what we would be doing about it in case it occurs? This encompasses looking for avenues to reduce the magnitude of the negative risk or do away with it completely, as well as finding ways to make sure the positive risks are more likely or would have a greater impact when they occur. At this point: all the parties involved agree on the risk response strategies in advance. Pieplow (2012) continued that generally, risk response strategies could either take the form of:

1. Avoidance – this is where threat is eliminated by eliminating the root cause;
2. Mitigation – where the consequences of a negative risk are reduced and its likelihood of occurrence or consequence of an opportunity is increased or maximized;
3. Transference – where risk responsibilities are passed on to another party. This is normally achieved through purchasing of insurance, performance bonds/guarantees, warranties, and outsourcing the work; and
4. Acceptance – Usually used when it is not possible to use any of the above strategies to respond to project risk.

This is where the strong connection that exists between risk and contract procurement starts. It is important that risk assessment is completed before the signing of a formal contract. Transfer of risk is normally enshrined in the contract terms and conditions (Public procurement Act, 2003).

However, when the risk events cannot be solved through the other techniques of risk response such as avoidance, transfer and mitigation, the only option that‟s remaining

becomes acceptance of it, and this is where one does nothing and say, well "if it happens, it happens". Acceptance may come as active acceptance and involves the making of contingency plans and passive acceptance which require that actions to be determined as needed. When a decision is taken to accept a risk, it must be communicated properly to the various stakeholders (Kamalesh & Salman, 2012).

It is also very important that when selecting a risk management strategy, remember that the strategy must be timely, the effort selected to match must be suitable to the severity of the risk and always avoid spending too much money in preventing risk that would have a small impact if it does occur. It is imperative to note that one response strategy can be used to address so many risks and the consent of the risk management team, all the stakeholders of the project and experts should be sought before the selection of a response strategy.

2.6.3 Monitoring and control of risk.

Nadeem, *et al.,* (2010) asserted that risk can effectively be checked by employing an indicator that predicts and keeps watch of the project as it nears a risk point. The approach here is to keep track of the risk by becoming part of the test team. The alternative ways of action prepared before the risk event occurs are known as contingency plans. A very common contingency plan is for example to set aside extra money, a contingency fund, to draw on in the event that an unforeseen cost overrun occurs. Contingency plans can be looked on as a kind of insurance and, like insurance policies, they can be very expensive. Risk monitoring and control is all about managing the project according to the risk responses plan and may include, Keeping track of the identified risks, Implementing risk responses strategies, looking out for the occurrence of risk triggers, Monitoring remaining risks, Identifying new risks and

Ensuring the execution of risk plans, Evaluating the effectiveness of risk plans, Developing new risk responses, Communicating risk status to team players and collecting risk status data, Communicating with stakeholders about risks, Determining if assumptions are still valid, Revisiting low ranking or non-critical risks to see if risk responses need to be determined, taking corrective actions to adjust to the severity of actual risk events, Creating a dependable database of all risk data that may be helpful for use on other projects of the organisation.

According to Pieplow (2012) continuous monitoring by the project risk manager and the project team ensures that new and changing risks are detected and managed and that risk response actions are implemented and effective. He continues to say that Risk monitoring continues for the life of the project. It also monitors the execution of planned strategies for the identified risks and evaluates their effectiveness. The project manager and the Project Risk Management Team (PRMT) should perform additional responses to control identified risk. To effectively control and monitor risk, there is the need to distribute evenly risk management responsibilities among project team members. The project manager is usually the ultimate person responsible for all risk but that does not mean that the responsibility cannot be shared among the project risk management team. Rahman and Kumaraswamy (2004) also agreed that during the project life cycle the nature and extent of identified risks may change and new risks may appear. Sometimes new risks may require joint efforts to manage them effectively and that Joint Risk Management (JRM) is about working hand in hand to mitigate project risks at the post contract stage of the work.

2.7 CHALLENGES TO RISK MANAGEMENT

Chileshe & Kikwasi (2013) argues strongly that the performance of a construction project is often affected greatly by the inherent risks existing within the internal and

external environments of the industry. Risk Management and Assessment Practices (RAMP) can be used to identify these risks and propose appropriate approaches to moderate them. Chileshe & Kikwasi (2013) however maintain that, the implementation of RAMP is usually fraught with barriers despite the far-reaching research on barriers affecting the implementation of RAMP especially in the developing countries of Africa.

Harner (2011) states firmly that any risk management technique attempts to provide decision makers with better and more accurate information to identify, assess, and mitigate events that threaten organisation‟s value (i.e., risk events). An organisation certainly can adopt strict procedures instructing managers on how and what types of information to evaluate, detailing the timing and participants in risk assessment meetings and requiring periodic reports to the board of directors and senior executives. Those procedures alone, however, will not necessarily change an organisation‟s decision regarding any particular risk, deter corporate fraud, individuals still make those decisions, and their possible biases and surrounding environment may be more influential than any risk assessment report (Harner, 2011).

Effective dissemination of risk information, participation in the process of risk management and creating a risk culture generally within an organisation can help a great deal to manage some of the difficulties to risk management.

According to Nerija and Audrius (2012), the lack of experience makes it very difficult to change the attitude of actors in the Lithuanian construction industry towards risk management. But maintains it is still important to include risk management in project management. Rogerio *et al.* (2014) agrees that risk management has become an increasingly challenging activity in recent times especially organizational risk management.

CHAPTER THREE RESEARCH METHODOLOGY

3.1 INTRODUCTION

The methodology provides an understanding of how the research was organized and conducted in order to obtain information that would be helpful in the exploration of risk management practices of MMDAs in construction project delivery. This chapter provided the features of the research developed and explained the survey methods used to gather information from the participants in the MMDAs that were targeted and also described how the data was collected and processed. It also detailed how participants were selected and approached; provided some characteristics of the questionnaire scripts.

3.2 RESEARCH DESIGN

The research explored the risk management practices of some MMDAs as regards to construction projects delivery. Risk management has been researched into by some reputable authors in the academic institutions in Ghana but risk management with regard to the MMDAs has been narrowly explored. This has given rise to the need for this study. The methodology used in gathering data for this study was the survey questionnaire. According to Naoum (1998) as cited in Danquah (2014), quantitative data are not abstract but consist of measurements of tangible, countable and sensate feature of the world. The research was carried out using two phase methodology in order to achieve the aim and objectives. The first was to embark on a literature search on previous publications such as journals, papers and books written by reputable researchers on risk management practices of public institutions. The literature review was carried out throughout the whole research project, this was to compile and discuss information on risk management practices. Various works were used as references such

as academic magazines, research journals, government publications, dictionaries, past project thesis and the internet.

In the second phase, questionnaires were developed solely based on the project objectives. All the project objectives were interpreted as research questions to enable the respondents give a fair response. The questionnaires were organized into four main sections as advanced:

1. Background information – this was where information about the respondents were collected, where they work, educational level, job title and how long they have worked with the Institution;
2. Risk planning and management in the MMDAs – this section had specific questions to find out whether the MMDAs surveyed plan for risk in the execution of construction works, have a risk management team and whether they draft risk management plans and registers for monitoring and control of risk;
3. Risk response strategies of the MMDAs – the respondents were encouraged here to show how they respond to some selected risks associated with construction projects; and
4. Difficulties associated with construction risk management in the MMDAs.

3.3 TARGET POPULATION

The research setting in this study was the Upper East and Northern Regions of Ghana. These places were chosen because basic rural infrastructural development projects are largely carried out by the Metropolitan, Municipal and District Assemblies (MMDAs) in the most challenging and remote locations.

For the purpose of the study, Metropolitan, Municipal and District Assemblies

(MMDAS) were used. A total of thirteen (13) MMDAs in the Upper East Region and Twenty-six (26) in the Northern Region making a total of thirty-nine (39) MMDAs were used.

3.3.1 Sample Size

Sample size simply refers to how many people you want to pick for your study. The pertinent question is how many are needed for a good survey? Three (3) professionals including the Engineer, Planning officer and Budget officer were selected from each MMDA for the study. These professionals form the core of the District Planning and Coordinating Unit (DPCU) responsible for project planning and monitoring at the MMDAs. Their functions are directly related to the subject matter of the study. The table below gives details of the MMDAs and the number of participants selected.

Table 3.1 List of MMDAs and sample size

No	Metropolitan, Municipal and District Assemblies (MMDAs)	No. of Questionnaires administered
1	Bole District	3
2	Bunkpurugu-Yunyoo District	3
3	Central Gonja District	3
4	Chereponi District	3
5	East Gonja District	3
6	East Mamprusi District	3
7	Gushegu District	3
8	Karaga District	3
9	Kpandai District	3
10	Kumbungu District	3
11	Mamprugo Moaduri District	3
12	Mion District	3
13	Nanumba North District	3
14	Nanumba South District	3
15	North Gonja District	3
16	Saboba District	3
17	Sagnarigu District	3
18	Savelugu-Nanton District	3
19	Sawla-Tuna-Kalba District	3

20	Tamale Metropolitan District	3
21	Tatale Sangule District	3
22	Tolon District	3
23	West Gonja District	3
24	West Mamprusi District	3
25	Yendi Municipal District	3
26	Zabzugu District	3
27	Bawku Municipal District	3
28	Bawku West District	3
29	Binduri District	3
30	Bolgatanga Municipal District	3
31	Bongo District	3
32	Builsa North District	3
33	Builsa South District	3
34	Garu-Tempane District	3
35	Kassena Nankana East District	3
36	Kassena Nankana West District	3
37	Nabdam District	3
38	Pusiga District	3
39	Talensi District	3
Totals		**117**

3.3.2 Sampling Technique

Purposive sampling technique was used to select participants for administering the questionnaires. Purposive sampling was used because it was easy to get a sample of subjects with specific characteristics and information to aid the study. Moazzam (2014) affirmed that purposive sampling is where the researcher has a fair knowledge of the research problem and based on that selects appropriate persons to be included in the sample.

3.4 RESEARCH TOOL

The ultimate research tool used for this study was a questionnaire, well structured so as to make it easier to obtain the necessary information from the participants. The questionnaire was written in clear and plain English. The questionnaire was then reviewed and some unclear terms revised according to the suggestions of my

supervisor.

3.5 DATA COLLECTION

The data used for the research was collected solely by the administration of questionnaires. A lot of mechanisms were used to locate data sources and obtain data from them. The internet was very useful in getting some of the contacts and location of the MMDAs. This was then followed by visiting the targeted participants. The purpose of the research work and the questionnaire was explained to them and a questionnaire administered. Sometimes, due to their (respondents) busy schedule, a date and time was set to come back and retrieve the questionnaire. Another mechanism used was to deposit some of the questionnaires at the MMDAs concerned in the Northern and Upper East Regions with some trusted individuals who then administered them to respondents on my behalf.

3.6 DATA ANALYSIS

The data collected was sorted and coded. Descriptive statistics and quantitative analysis approach was employed for the study. The survey response from the targeted participants was then analyzed using frequencies, percentages and Relative Importance Indices (RII) aided by the Statistical Package for Social Sciences (SPSS) and Microsoft excel. Relative Importance Index RII = $\sum$ w /AN

Where w denotes the weighting given to each variable by the respondent and ranges from 1-4 for section C and 1 to 5 for section D respectively.

A denotes the highest weight, and N = total number of sample.

This method was used because it produced a final number (index), which represented an overall estimation of the relative importance of a variable.

3.7 PROTECTION OF HUMAN SUBJECTS

Ethical principles in obtaining the data:

- The consent of the participants was sought as the foremost step after explaining the research project‟s objectives to them;
- They were then assured that information provided would be kept confidential and discussed only between the research student and his supervisor;
- The participants were also given the assurance that anonymity of their identity would be preserved; and
- It was ensured that participants responding to the questionnaire or in an attempt to answer the questions were not subjected to any form of harm, by having to travel to dangerous sites for observation in order to answer the questionnaire or provide information about their institutions, major financial assets, which they are not comfortable with.

CHAPTER FOUR DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

The method used in analyzing the quantitative data was descriptive statistics by the statistical package software SPSS.v16-EQUiNOX. This method is based on data codification; the key elements contained in the information given (in this case given by the respondents) were transformed into units that facilitated their description and analysis. Frequencies, means, percentages, relative importance indices were used to describe the relationships between various variables. A total of one hundred and seventeen (117) questionnaires were sent out for the data gathering and 88 of the questionnaires were successfully retrieved at least one questionnaire from each of the responding District Assembly. This represented about 75.2% Response rate.

4.2 DEMOGRAPHIC DATA

A Major percentage of the respondents were Engineers in the MMDAs surveyed constituting 52.3% of the total. This is good for the research because Engineers apart from being the project managers for construction projects at the MMDA level they also participate actively during the preparation of annual action plans for the MMDAs. This indicates strongly that information provided by them was dependable. It is also important to note that at the District Assemblies, Quantity Surveyors, Civil Engineers, Technician Engineers, Architects who are heads of Works departments are all referred to as „Engineers" and most often carry out each other"s roles depending on the availability of other professionals in the Department.

From Table 2, majority of the respondents have work experience from 5-10 years with 39.8% as shown followed by those with work experience of 3-5years constituting 27.3%. This represents a good number of years working with the MMDAs in order to be familiar with the practices and procedures for doing things in these institutions.

The analysis further shows that a greater number of the respondents were holders of either a Bachelor"s Degree in Science or in Art representing 54.5% of the responses. This is more than half of the total responses and having a higher level of education means that the respondents have a fair appreciation of the issues in the questionnaire and are therefore in a better position to give reliable responses.

Table 4. 1Demographic data

Variables	Frequency	Percentage (%)	Valid Percentage (%)	Cumulative Percentage (%)
Job Description				
Engineer	46	52.3	52.3	52.3
Planning Officer	22	25	25	77.3
Budget Officer	20	22.7	22.7	100
Total	88	100	100	

Working Experience				
1-3	12	13.6	13.6	13.6
3-5	24	27.3	27.3	40.9
5-10	35	39.8	39.8	80.7
10-15	11	12.5	12.5	93.2
>15	6	6.8	6.8	100
Total	88	100	100	
Level of education				
CTC	5	5.7	5.7	5.7
HND	17	19.3	19.3	25
BSc/BA	48	54.5	54.5	79.5
MSc/MPhil/MA	18	20.5	20.5	100
Total	**88**	**100**	**100**	

4.3 RISK PLANNING AND MANAGEMENT IN THE MMDAs

Ahmed *et al* (2001) defined Risk planning as "deciding how to approach and plan the risk management activities for a project. This is a key stage to project risk management and if it"s lacking from the beginning then it affects the rest of the subsequent process. It is unfortunate that from the table above, a swooping 40.9% of the total responses turned out to be "sometimes". It indicates that most of the MMDAs surveyed sometimes prepare risk management plans for their construction projects whiles almost 27.3% of them do not prepare risk plans for their projects at all. Only 13.6% plan for risk all the time. Close interaction with some of the respondents revealed that even those who think they practice risk management planning turned out to be not exactly what it is meant to be. At the MMDA level there is usually an organized body known as the District Planning and Coordinating Unit (DPCU) that has the responsibility for planning and monitoring developmental projects of the Various Assemblies. A close study of the Unit"s work showed that the Monitoring function overshadows that of the planning and does not have anything in common with project risk planning. The results above clearly indicate that the MMDAs sometimes plan for project risk.

From Table 3 below, almost 78.4% of the respondents do not have project risk management teams in their institutions. 21.6% of them responded „yes" showing they have a defined project risk management team in their Assemblies but most of them referred to the DPCU mentioned above as the team responsible for project risk management. Upon further request, it became clear that the core mandate of the DPCU has nothing to do with risk management. In effect, majority of the MMDAs surveyed have no defined project risk management team to plan and manage development projects.

Demonstrated in the table above, majority of the MMDAs surveyed do not have a defined risk management team to handle risk responsibilities instead a team is formed when the risk event occurs. This was evident as 37.7% of the valid responses affirmed this representing the highest. 31.9% think that it is the responsibility of the chief executive. 20.3% also believed that the responsibility for construction risks should be handled by the officer who directly supervises the project. Examples here would be the project manager or the Engineer handling poor workmanship by the contractor. About 10.1% of the MMDAs also had it that certain risk events when they occur are simply left to their own fate. This is seen when politicians decide where developmental projects should be located against the action plan of the Institution.

From Table 3, 42.1% of the respondents who had defined risk management teams in their institutions, majority are a combination of Engineers, Planning Officers, Budget Officers. These professionals form the core of any project monitoring and coordinating unit in the MMDAs and come face to face with the risk associated with construction projects.

As shown in the Table 3, more than 42% of the MMDAs surveyed do not draft project risk plans and registers for the management of risk in the execution of their various construction projects. Another 40.9% of the total MMDAs surveyed sometimes prepare risk plans and registers for their construction projects. This supports the point above that most of the MMDAs surveyed do not have defined project risk management teams. This practice affects greatly construction project risk management as there is no plan to begin with. Most of the MMDAs handle risk events as and when they occur though sometimes these project risks may visit upon them severe repercussions.

Table 4. 2: Risk planning and management in public institutions

Variables	Frequency	Percentage (%)	Valid Percentage (%)
The MMDAs Plan for risk in the execution of construction works			
All the time	12	13.6	13.6
Most of the time	16	18.2	18.2
Sometimes	36	40.9	40.9
Not at all	24	27.3	27.3
Total	88	100	100
There exist a defined project risk management team Yes			
	19	21.6	21.6
No	69	78.4	78.4
Total	88	100	100
Handling risk responsibilities simply left to their fate			
	7	8	10.1
Team formed when risk event occurs	26	29.5	37.7
sole responsibility of the chief executive	22	25	31.9
Responsibility of the supervising officer	14	15.9	20.3
Total	69	78.4	100
Missing System	19	21.6	
Total	88	100	

Professionals constituting risk management team in the MMDA			
Engineers, Architects, QS, Project Managers	1	1.1	5.3
Engineers, Planning Officers, Budget Officers	8	9.1	42.1
Engineers, Planning Officers, Budget Officers, Finance Officers, user agencies	6	6.8	31.6
Engineers, Planning Officers, Budget Officers, Finance Officers, Auditors	4	4.5	21.1
Total	19	21.6	100
Missing System	69	78.4	
Total	88	100	
MMDA drafts Project risk plans and register to monitor and control risk All the time	6	6.8	6.8
Most of the time	9	10.2	10.2
Sometimes	36	40.9	40.9
Not at all	37	42	42
Total	88	100	100

4.4 RISK FACTORS ASSOCIATED WITH CONSTRUCTION WORKS

The table 4 below shows the analyses of the section C of the questionnaire using frequencies and percentages. The response strategies with the highest and second highest response rates were discussed below.

Table 4. 3: Risk factors associated with construction works and response strategies

Code	Risks Factors Associated with Construction works	Avoid (1)		Mitigate(2)		Transfer (3)		Accept(4)	
		Freq	%	Freq	%	Freq	%	Freq	%
1	Misinterpretation of user's needs	42	47.7	31	35.2	0	0	15	17
2	Errors in detailed design	34	38.6	40	45.5	9	23	5	5.68
3	Unavailability of site during design	38	43.2	28	31.8	10	26	12	13.6
4	Land acquisition challenges in Towns and Cities	30	34.1	38	43.2	6	15	14	15.9
5	Unwillingness of rural land owners to release land for public projects	31	35.2	27	30.7	10	26	20	22.7
6	Unrealistic time frame for the project	28	31.8	37	42	12	31	11	12.5
7	Influence by political figures in deciding locations for public projects	19	21.6	19	21.6	12	31	38	43.2
8	Unable to meet tender opening date	37	42	24	27.3	15	38	12	13.6
9	Inadequate/misleading information in tender documents	24	27.3	43	48.9	7	18	14	15.9
10	Evaluation panel members not qualified (have interest in project)	41	46.6	26	29.5	8	21	13	14.8
11	Contractor withdraws tender after closing date for opening of tenders	32	36.4	19	21.6	30	77	7	7.95
12	Contractor refuses to go to site after taking advance payment	28	31.8	16	18.2	34	87	10	11.4
13	Inclement Weather	24	27.3	24	27.3	11	28	29	33
14	Bureaucracy	28	31.8	38	43.2	6	15	16	18.2
15	Inadequate financial resource (Client)	28	31.8	35	39.8	8	21	17	19.3
16	Delay in payment for work done/claim	30	34.1	30	34.1	13	33	15	17
17	Changed scope of work	29	33	30	34.1	8	21	21	23.9
18	Poor quality of work	39	44.3	33	37.5	11	28	5	5.68
19	Poor supervision by Consultant	40	45.5	33	37.5	8	21	7	7.95
20	Cash flow difficulties (Contractor)	27	30.7	41	46.6	8	21	12	13.6
21	Excessive contract variations	29	33	34	38.6	6	15	19	21.6
22	Contractor abandons project without just cause	22	25	27	30.7	30	77	9	10.2
23	Material Price fluctuations (inflation)	21	23.9	33	37.5	11	28	23	26.1
24	Unnecessary delay in payment of Retention money for contractors	44	50	32	36.4	5	13	7	7.95
25	Destruction of parts of the project due to act of God „force majeure“	21	23.9	31	35.2	6	15	30	34.1
26	Non-Compliance with government policies	27	30.7	22	25	13	33	26	29.5

27	Change of Government	24	27.3	19	21.6	9	23	36	40.9
28	Pollution	35	39.8	42	47.7	4	10	7	7.95
29	Environmental damage	33	37.5	31	35.2	9	23	15	17

Misinterpretation of user's needs – it is clear from the above table that a good number of 42 of the respondents representing 47.7% avoided this risk factor in the MMDA‟s as compared to 35.2% of those who will mitigate and 17% of those who would accept it.

Errors in detailed design – about 45.5% had it that this risk should be mitigated followed by 38.6% who will avoid it. 10.2% and 5.7% will transfer and accept respectively. Errors in detailed design cannot always be avoided 100% but mitigated when it happens as designs are prepared by humans.

Unavailability of site during project design – about 43.2% of the respondents will avoid this factor when the designs are being prepared. This is very important as finished designs may not be in harmony with the site/location.

Land Acquisition challenges in Towns and Cities – a higher 43.2% of the respondents will mitigate this factor and 30.8% will avoid it at all. Land acquisition in built up towns and cities can be very hectic though inevitable hence the need to be mitigated if not avoided.

Unwillingness of rural land owners to release land for public projects – 35.2% of the participants avoided this risk factor and 30.7% of them will mitigate it. Landlords at the rural level may hesitate to release land for public projects since that will deprive the whole family the benefits of the land and that can affect project siting/location. The better it is mitigated or avoided.

Unrealistic time frame for the execution of projects – 42% of the respondents will mitigate this risk factor as compared to 31.8% of those who would avoid it.

Unrealistic time for completion of projects will adversely affect the contractor‟s work programme and impose unjustly the liquidated and Ascertained Damages on the Contractor.

Influence by political figures in deciding locations for public projects – 43.2% of the results as shown above will accept the risk factor compared to a lesser 13.6% who will transfer the risk. The planning committees of the MMDAs are usually powerless when a higher political figure decides the location for a project. This usually comes from the Members of Parliament (MPs) and the District Chief Executives (DCEs) and sometimes from the national level. When this happens, the only option is to accept and deal with it.

Unable to meet tender opening dates – 42% of the results showed that this particular risk factor is avoided by the MMDAs as it is the highest and if it does occur, it is mitigated or transferred with a 27.3% and 17% response rates respectively.

Inadequate/misleading information in tender documents – tender documents are prepared by humans and not machines hence the tendency of omissions. 48.9% of the respondents will mitigate this risk and 27.3% of them will avoid it altogether.

Omissions in tender documents sometimes occur and are usually mitigated at the MMDA level.

Evaluation Panel has interest in the project – when evaluation panel members have interest in the project, then the process will not be fair as they tend to protect their interest to the detriment of the competitive bid. 46.6% of the results confirmed that the MMDAs usually avoid this risk event by selecting an ad hoc panel that has no interest in the work whiles 29.5% go with mitigation if it does occur.

Contractor withdraws tender after closing date for opening of tenders – a swooping 36.4% of them would avoid this risk event followed by 34.1% transfer. In the preparation of tender documents the Public Procurement Conditions (PPC) allows for the provision of tender security in the form of a bid bond from an insurance company or a bid guarantee from a bank acceptable to the employer. The risk thus is transferred to the insurance company or the Bank.

Contractor refuses to go to site after taking advance payment – advance payment is usually called mobilization and paid to a contractor to prepare and mobilize to site and begin the execution of the works. About 38.6% of the response went in favor of transferring the risk if it occurs and 31.8% of them avoid it. There is usually a contract provision for advance payment to the contractor but which must be guaranteed so that in default the client will hold on to that. By so doing the risk is transferred to the insurance company/bank.

Inclement weather – weather though can be forecasted is always unpredictable. It is a risk that every construction project terrors. It cannot be avoided or transferred. Majority of the respondents 33% accepted that this risk needs to be accepted and dealt with. 27.3% of them will mitigate and avoid the adversaries posed by the weather.

Bureaucracy – from the table above, 42% being the highest response rate will mitigate any insistence on unnecessary procedures and red tapes. Most government institutions face this challenge and it‟s very difficult to avoid. About 31.8% of the responses however, will accept bureaucracies and find ways of dealing with them.

Inadequate financial resources – the client‟s inability to provide regular funding for a project could prove inimical to its success. A higher 39.8% of the results indicated that this risk factor is mitigated in the MMDAs and also accepted and dealt with as its

ranked second. The funding sources available to the MMDAs as disclosed by some of the respondents upon request were the District Development facility (DDF) and the District Assembly Command Fund (DACF) and these are not always regular hence the need to mitigate.

Delay in payment for work done/claim - mitigating this risk scores 34.1% of the total response and 34.1% too for avoid it. Especially with DACF projects at the MMDAs, delays in payment for work done are inevitable owing to the fact that even the funds are not regular. The MMDAs usually try to lessen the impact of delay in payment for work done and not avoid it as proven in the table results.

Changed scope of work – 34.1% of the responses will mitigate a change to the scope of work and 33% will avoid it happening. Changed scope of work is usually as a result of the client wanting more functionality than initially catered for or a reduced amount of work. Either way has its own set of issues and when it is reviewed upwards could add a huge sum of money to the project budget.

Poor Quality of work – this risk results from poor supervision by the project consultants. 44.3% of the responses will avoid it. This risk is avoidable by prompt supervision and if this is missing one would spend the entire time mitigating the effects of it.

Poor Supervision by the consultant – it is a generally accepted fact that if there is poor supervision by the project supervisors then that project is heading for doom.
45.5% of the results as shown above would avoid this as against 37.5% of mitigation. Consultant must avoid poor supervision at all cost rather than compromising and spend the rest of the project life mitigating the effects of poor supervision.

Cash flow difficulties – the contractor‟s cash flow is affected by a lot of factors and partly by the client when there is an unnecessary delay in payment for work properly executed. As shown above, 46.6% of the respondents will mitigate this factor and 30.7% of them will avoid it.

Excessive contract Variations – 33% accept variations in project delivery whiles 38.6% will mitigate this risk factor when it occurs. Contract variations cannot be avoided in construction contracts and when they are not properly mitigated can lead to bitter disputes between parties that can compromise project objectives.

Contractor abandons project without just cause – a swooping 34.1% of the responses will transfer this risk and 30.7% will mitigate it at all. There are usually a number of reasons why a contractor would abandon a construction project. Some may come from the client but that must not be done without a just cause. The standard conditions of contract used by the MMDAs as provided by the Public Procurement Authority (PPA) have provisions for transferring the risk of non-performance by the contractor to a third party usually an insurance company/bank.

Material price fluctuations – price inflation of building materials are determined by the mechanics of demand and supply and are very unstable in this in Ghana. 37.5% of the responses as shown in the table above will mitigate the risk and 26.1% will accept the factor.

Destruction of parts of the work due to an "act of God" – Act of God is known in construction contract terms as "force majeure" and denotes happenings that cannot be attributed to either party. 35.2% responded mitigate and 34.1% responded accept. Act of God cannot be determined by human and is therefore out of our control and hence

acceptance is the predominant option. Even the public procurement conditions used by the MMDAs accept it.

Change of government – change of government is determined by a whole nation and affects construction projects greatly. In the event of it, a higher 40.9% of the responses went in favour of acceptance. Accepting change of government is the viable response strategy at the MMDAs as they operate directly under the ruling government. Any other strategy would prove to be a waste of time.

Pollution – pollution resulting from construction activities occurs in one way or the other around construction sites. 47.7% of the valid responses will mitigate it which is good and another 39.8% will avoid the effects. When construction is carried out in a well-planned and organized manner, pollution can be avoided or if at all mitigated so as not to cause serious environmental degradation.

Environmental damage – 37.5% of the respondents will avoid environmental damage resulting from construction projects whiles 35.2% of them will mitigate the consequences if it occurred. At the MMDAs it has become an audit requirement for Environmental Protection Agency (EPA) certification for capital projects some of the respondents disclosed.

The results from table 4 above can also be sorted to indicate how many variables were best responded to under a particular risk response strategy viz; Avoid, mitigate, transfer and accept.

4.4.1 Risk factors best responded to by „avoidance"

From Table 5 those risk factors that are most responded to by using the „avoidance" strategy in the MMDAs. The risk factors under „avoid" are now compared to identify

the factor that ranks higher among them. Unnecessary delay in payment of Retention money for contractors, Misinterpretation of user's needs and Evaluation panel members not qualified (have interest in project) are ranked 1st, 2nd and 3rd respectively. These factors are most responded to by avoiding their occurrence in the MMDAs according to the results.

Table 4. 4 Risk factors best responded to by „avoidance"

Code	Risks Factors Associated with Construction works	Response Strategy Avoid Fı	%	Ranking
1	Misinterpretation of user's needs	42	47.7	2nd
3	Unavailability of site during design	38	43.2	6th
5	Unwillingness of rural land owners to release land for public projects	31	35.2	9th
8	Unable to meet tender opening date	37	42	7th
10	Evaluation panel members not qualified (have interest in project)	41	46.6	3rd
16	Delay in payment for work done/claim	30	34.1	10th
18	Poor quality of work	39	44.3	5th
19	Poor supervision by Consultant	40	45.5	4th
24	Unnecessary delay in payment of Retention money for contractors	44	50	1st
26	Non-Compliance with government policies	27	30.7	11th
29	Environmental damage	33	37.5	8th

4.4.2 Risk factors responded to by using „Mitigate" strategy

Among all the risk factors shown in Table 6 the most responded to by „mitigating" were Inadequate/misleading information in tender documents ranked 1st followed by pollution and thirdly Cash flow difficulties (Contractor). These come highest because most of the respondents in the MMDAs actually respond to these risks by mitigation.

Table 4. 5 Risk factors responded to by using „Mitigate" strategy

Code	Risks Factors Associated with Construction works	Response Strategy Mitigate(2) Freq	%	Ranking
2	Errors in detailed design	40	45.5	4th

4	Land acquisition challenges in Towns and Cities	38	43.2	5th
6	Unrealistic time frame for the project	37	42	6th
9	Inadequate/misleading information in tender documents	43	48.9	1st
14	Bureaucracy	38	43.2	5th
15	Inadequate financial resource (Client)	35	39.8	7th
16	Delay in payment for work done/claim	30	34.1	11th
17	Changed scope of work	30	34.1	11th
20	Cash flow difficulties (Contractor)	41	46.6	3rd
21	Excessive contract variations	34	38.6	8th
23	Material Price fluctuations (inflation)	33	37.5	9th
25	Destruction of parts of the project due to act of God „force majeure"	31	35.2	10th
28	Pollution	42	47.7	2nd

4.4.3 Risk factors responded to by „transfer" strategy

Among the risk factors that are responded to by using transfer of risk, Contractor refuses to go to site after taking advance payment was most responded to by transfer as it ranked 1st in the table below. It is interesting to note that for the three risk factors contained in the table above that are transferred when they occur; the Public Procurement Conditions of Contract (PPCC) also have provisions for transfer of these risks to a third party and the MMDAs use mostly the Public Procurement Conditions of Contract for their construction projects. Usually it is a bond from an insurance company or a guarantee from a bank.

Table 4. 6 Risk factors responded to by „transfer" strategy

Response Strategy	Risks Factors Associated with Construction works	Transfer(3) Freq	%	Ranking Code
11	Contractor withdraws tender after closing date for opening of tenders	30	77	2nd
12	Contractor refuses to go to site after taking advance payment	34	87	1st

22	Contractor abandons project without just cause	30	77	2nd

4.4.4 Risk factors responded to by „Acceptance‟ strategy

The analysis in Table 7 presents a very interesting scenario, of the risk factors that are best responded to by acceptance, Influence by political figures in deciding locations for public projects comes 1st among them and followed by Change of Government and thirdly Inclement Weather. All these risk factors cannot simply be responded to by avoidance or mitigation or simply transfer. Politicians in power would always want development projects to go to their support strong holds irrespective of whether it is a necessity or not or whether it goes against action plans of a mandated institutions and the only response strategy is to accept and move along. No one can avoid „inclement weather‟ when it occurs you accept and find ways of dealing with it. When there is a change of government, politicians loose interest in continuing with projects started by the previous government and there is always little one can do about it.

Table 4. 7 Risk factors responded to by using „Acceptance‟ strategy

Code	Risks Factors Associated with Construction works	Response Strategy		Ranking
		Accept(4)		
		Freq	%	
7	Influence by political figures in deciding locations for public projects	38	43.2	1st
13	Inclement Weather	29	33	3rd
27	Change of Government	36	40.9	2nd

4.5 DIFFICULTIES ASSOCIATED WITH CONSTRUCTION RISK MANAGEMENT

Table 9 below shows the results of the relative importance index (RII); statistical method of analysis carried out. This method of analysis of descriptive data is a little ahead of the frequencies and percentages method as mentioned earlier. This is because, this method does not deal with one variable at a time, it compares all the variables and indicates the variables with the most influencing effect on the subject area by presenting the various relative importance of the variables. Tabular form data is however required.

Relative importance index (RII) = $(\sum W)/AN$

Where A = highest rating (i.e. 5 in this case)

N = total number of sample (in this case all being 88 for each)

W= weighting multiplied by the frequency of occurrence for a particular variable

Table 9 below is a summary of the relative importance index analysis for difficulties associated with construction risk management. It is evident that that „Risk management process is intimidating" is ranked 1st, though with an average mean of 3.0909 indicating neutrality to this variable. However, 36 of the total responses disagreed with the variable, 8 of them strongly disagreed, 14 strongly agreed, 16 agreed and 14 remained neutral. Majority disagreed with the variable but an aggregate of the various response strongly agree, agree and neutral weighted the variable almost to the neutral. Ranked 2nd was „risk management is a complicated process". This variable also had a mean value of 3.0682 also indicating closeness to an overall neutral response. It is equally interesting to realize that 36 of the responses disagreed, 10 strongly disagreed, 15 and

20 strongly agreed and agreed respectively and 7 remained neutral. A similar pattern as above also exists here. Using only the frequencies clearly indicated that majority disagreed with the variable but for the sum of the frequencies for strongly agree, agree and neutral which has weighted down the frequencies to a neutral mean. Contractor‟s unwillingness to help consultants manage project risk was also strongly disagreed with a frequency of 39, 9 of the responses strongly disagreed, 17 strongly agreed, 19 agreed and only 4 remained neutral. It is very interesting again to note that the mean of 3.0455 for this variable indicates a neutral position. This came about as results of the aggregate of the frequencies for strongly agree, Agree and Neutral. This indicates good cooperation from contractors on project risk management in the MMDAs. Majority of the responses received however remained neutral that risk management consumed financial resources with frequency of 25 for Neutral, 15 for strongly agree, 24 for Agree, 14 for Disagree and 10 for Strongly Disagree. The RII indices how ever showed that the overall mean is shifted towards the Agree side with an average of 2.7727. „Risk management is nobody's business‟ was ranked 5th according to the table below, from the section B of the analysis of the survey responses, it was shown that most of the MMDAs have no defined risk management teams to take charge of risk responsibilities. The absence of such an important team in an organization means that when it comes to risk responsibilities, nobody will stand out boldly to claim. No planning for risk, the absence of risk registers in majority of the MMDAs surveyed means risk is simply handled when it occurs. Risk register is an effective tool that enables the project risk team to identify, analyze, assess, treat, monitor and communicate risks (Cooper et al., 2005 cited by Gajewska & Ropel, 2011). This tool is developed at the initial stages of risk planning and updated as the project is being executed. Newly identified risks are added and old ones that have not occurred are dropped. If this all important tool is

missing from the beginning, then when a risk event occur later during the execution of the project, there would be no road map to manage the risk and there would be limited time to think about forming a risk management team. Ineffective dissemination of risk information was largely agreed as a difficulty to risk management in the MMDAs and ranked 7th.

The lack of risk management meetings as a difficulty to project risk management was strongly affirmed by the responses received. So due to this short coming, most people in the MMDAs see risk management as a time consuming process.

It was agreed firmly by the respondents that risk management is too academic. The majority of respondents are holders of a Bachelor‟s degree as indicated in the section A of the analysis and is interesting to know that most would have studied risk management as part of their courses at the university.

Table 4. 8 Difficulties associated with construction risk management and ranking by method of relative importance index (RII)

Code	Difficulties associated with Construction risk management in the MMDA's	Mean	Relative Importance Index (RII)	RII (%)	Rank
		∑ W/N	∑ W/A*N	(∑ W/A*N)*100	
1	Educational level of management staff	2.0909	0.4182	41.82	18th
2	Little Knowledge about construction risk management	2.3523	0.4705	47.05	14th
3	Lack of Experience by management staff in project risk management	2.125	0.425	42.5	16th
4	Absence of project Risk plan	2.5114	0.5023	50.23	9th
5	Absence of project Risk Registers	2.6023	0.5205	52.05	6th
6	Lack of risk assessment meetings	2.5795	0.5159	51.59	8th
7	Management of institution not interested in project risk management	2.4091	0.4818	48.18	13th

8	Ineffective dissemination of risk information	2.5909	0.5182	51.82	7th
9	Political influence	2.1023	0.4205	42.05	17th
10	Lack of formal processes for project risk management	2.3068	0.4614	46.14	15th
11	Construction is done in the open hence impacted heavily by weather and environmental conditions	2.0795	0.4159	41.59	19th
12	Contractors unwillingness to help consultants manage project risk	3.0455	0.6091	60.91	3rd
13	Risk management is time consuming	2.4773	0.4955	49.55	10th
14	Risk management is too academic	2.4318	0.4864	48.64	11th
15	Risk management is complicated process	3.0682	0.6136	61.36	2nd
16	No formal risk management framework	2.4205	0.4841	48.41	12th
17	Risk management process is intimidating	3.0909	0.6182	61.82	1st
18	Risk management consumes financial resources	2.7727	0.5545	55.45	4th
19	Risk management is nobody's business	2.6932	0.5386	53.86	5th

CHAPTER FIVE CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The chapter five presents the final section of the research work and it delivers the review of the objectives initially set, gives a summary of the findings as analyzed from the research questions, draws conclusions from the findings of the work and gives recommendations for further action based on the findings of the research.

5.2 REVIEW OF THE OBJECTIVES

To be able achieve the main aim of this research work which was to explore the risk management practices of The MMDAs in the execution of construction projects, a number of objectives were set to help in this regard.

The objective one (1) sought to find out whether the MMDAs plan for risk in the execution of construction works. According to the survey and responses obtained from the appropriate research questions, the majority of MMDAs surveyed do not have defined risk management teams and so no risks plans and registers are drafted to monitor and control risks. The absence of risk plans and registers indicates that risks event then leads to the formation of a team to handle it as the responses indicated.

The objective two (2) also attempted to identify ways the MMDAs respond to construction project risk. From the analysis of the responses, it showed that the MMDAs surveyed respond to different risk factors by avoidance, mitigation, transfer and acceptance as presented in the findings.

The third (3) objective tried to identify the difficulties involved in project risk management in the MMDAs. From the survey responses there was a strong indication that indeed the institutions face some difficulties with project risk management which are elaborated in the findings that follow.

5.3 SUMMARY OF FINDINGS

The findings of the study established that the MMDAs have no formal process for planning risk management in the execution of construction works. The survey responses analyzed showed that the MMDAs do not have defined risk plans and registers for effective management of risks. The perception of risk planning is sometimes vaguely understood by the MMDAs as the planning for capital projects by the District Planning and Coordinating Unit (DPCU). In this study, it has been found out that unnecessary delay in payment of Retention money for contractors, Misinterpretation of user's needs and Evaluation panel members not qualified (have interest in project) are risk factors that are most responded to by avoiding their occurrence in the MMDAs surveyed. In

the same vein, Inadequate/misleading information in tender documents, pollution and Cash flow difficulties (Contractor) are also most responded to by mitigation. Contractor abandons project without just cause, Contractor withdraws tender after closing date for opening of tenders and Contractor refuses to go to site after taking advance payment risks are most responded to by transfer at the MMDA level and among all the risk factors that are responded to by acceptance strategy, Influence by political figures in deciding locations for public projects, Change of Government and inclement Weather tops them.

There are several challenges at the MMDA level that make it difficult for risk management and among them „Risk management process is intimidating" was moderately disagreed. It was also moderately disagreed that risk management is a complicated process. Most of the respondents agreed that political influence, lack of risk planning, lack of experience hinders project risk management.

5.4 CONCLUSIONS

From the findings of the study, it was realized that the process of risk management and risk planning are not complicated neither are they intimidating or time consuming. The sheer lack of formal processes for project risk management coupled with lack of experience by management staff in project risk management and undue influence from political leaders have incapacitated the MMDAs from effectively practicing project risk management as portrayed by the findings of the study.

5.5 RECOMMENDATIONS

Through this work, it has also been realized that professional project risk management is seldom practiced in the MMDAs surveyed and more work needs to be done especially on the development of a framework for project risk management. It is thus recommended that:

1. The Local government secretariat should organize training workshops on professional risk management for project actors in the MMDAs in Ghana.
2. The MMDAs should be allowed to work independently devoid of political interference in their core business of providing development.
3. The chief executives of the MMDAs should be sensitized on project risk management to ensure that it is given equal priority and;
4. Upcoming researchers interested in project risk management should tailor their research efforts in developing a framework for the management of construction risks in the MMDAs.

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APPENDIX

THE KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI, GHANA

COLLEGE OF ART AND BUILT ENVIRONMENT

DEPT OF BUILDING TECHNOLOGY

QUESTIONNAIRE

Research topic: Exploring the risk management practices of The MMDAs in construction project delivery

Research student: ADALIWOR W ISAAC Contact: 0245804608

The questionnaire seeks to explore the knowledge level and management of Risk by the MMDA‟s in construction projects been executed by these institutions.

This exercise is purely academic and information provided shall be used as such. Your assistance in answering the following questions will be very much appreciated.

Please tick [√] in the spaces provided. Tick once for each question unless otherwise stated.

SECTION A

BACKGROUND INFORMATION

Name of MMDA ……..

1. Please indicate your Job title?

a) Engineer [ ] b) Planning officer [ ] c) Budget

officer [ ]

2. How long have you worked in this position? (years)

a) 1-3 [ ] b) 3-5 [ ] c) 5-10 [ ] d) 10-15 [ ] e) > 15 [ ]

3. Please indicate your highest level of Education?

a) CTC [ ] b) HND [ ] c) BSc/BA [ ]

d) MSc/MPhil/MA [ ]

d) Other, please

specify……

SECTION B

RISK PLANNING AND MANAGEMENT IN PUBLIC INSTITUTIONS

(THE MMDA"S)

4. Your institution plan for risk in the execution of Public construction projects

a) All the time [ ] b) most of the time [ ]

c) Sometimes [ ] d) not at all [ ]

5. Do you have a defined project risk management team in your organization?

a) Yes [ ] b) No [ ]

6. If „No" how are risks responsibilities handled in your institution?

a) Simply left to their fate [ ]

b) Team formed when risk event occurs [ ]

c) Sole responsibility of the Chief Executive [ ]

d) Responsibility of the Supervising officer (work) [ ]

7. If „yes" please „Tick" the professionals listed here that constitutes your project risk management team?

a) Engineers [ ] b) Planning officers [ ]

c) Budget officers [ ] d) Internal Auditors [ ]

e) Finance officers [ ] g) [ ]

i) Others, please specify

……

……

8. Does your institution draft project risk plans and registers for all your capital projects in order to monitor and control risk?

a) All the time [ ] b) most of the time [ ]

c) Sometimes [ ] d) not at all [ ]

SECTION C

RISK RESPONSE STRATEGIES OF PUBLIC INSTITUTIONS (THE MMDA"S)

How does your institution deal with the risks shown in the table below usually associated with construction projects?

Use the risk response strategies given below scaled 1-4. (<u>Please check appropriate response</u>)

a. **Avoid**. Risk can be avoided by removing the cause of the risk or executing the project in a different way while still aiming to achieve project objectives.

b. **Mitigate**. Risk mitigation reduces the probability and/or impact of an adverse risk event to an acceptable threshold.

c. **Transfer**. Transferring risk involves finding another party who is willing to take responsibility for its management, and who will bear the liability of the risk should it occur.

d. **Acceptance**. This strategy is adopted when it is not possible or practical to respond to the risk by the other strategies, when the project manager and the project team decide to accept a risk; they are agreeing to address the risk if and when it occurs.

CODE	TYPICAL RISKS FACTORS ASSOCIATED WITH CONSTRUCTION WORKS	RISK RESPONSE STRATEGIES			
		1	2	3	4
		Avoid	Mitigate	Transfer	Accept
	PLANNING AND DESIGN STAGE				
1	Misinterpretation of users‟ needs				
2	Errors in detailed design				
3	Unavailability of site during design				
4	Land acquisition challenges in Towns & Cities				
5	unwillingness of rural land owners to release land for public projects				
6	Unrealistic time frame for execution of projects				
7	Influence by political figures in deciding locations for public projects				
	TENDERING/EVALUATION STAGE				
8	Unable to meet tender opening date				

9	Inadequate/misleading information in tender documents				
10	Evaluation panel members not qualified (have interest in project)				
11	Contractor withdraws tender after closing date for opening of tenders				
	CONSTRUCTION STAGE				
12	Contractor refuses to go to site after taking advance payment				
13	Inclement Weather				
14	Bureaucracy				
15	Inadequate of financial resource (Client)				
16	Delay in payment for work done/claim				
17	Changed scope of work				
18	Poor quality of work				
19	Poor supervision (by consultant)				
20	Cash flow difficulties (Contractor)				
21	Excessive contract variations				
22	Contractor abandons project without just cause				
23	Material Price fluctuations (inflation)				
24	Unnecessary delay in payment of Retention money for contractors				
25	Destruction of parts of the project due to act of God „force majeure“				
26	Non-Compliance with government policies				
27	Change of Government				
28	Pollution				
29	Environmental damage				

SECTION D

DIFFICULTIES ASSOCIATED WITH CONSTRUCTION RISK MANAGEMENT IN PUBLIC INSTITUTIONS

Please indicate to what extent you agree by checking (√) the appropriate response for all the difficulties listed in the table below associated with construction risk management in the MMDA“s

CODE	**TYPICAL DIFFICULTIES**	**RESPONSE AND SCALE**				
		1	**2**	**3**	**4**	**5**

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Educational level of management staff					
2	Little Knowledge about construction risk management					
3	Lack of Experience by management staff in project risk management					
4	Absence of project Risk plan					
5	Absence of project Risk Registers					
6	Lack of risk assessment meetings					
7	Management of institution not interested in project risk management					
8	Ineffective dissemination of risk information					
9	Political influence					
10	Lack of formal processes for project risk management					
11	Construction is done in the open hence impacted heavily by weather and environmental conditions					
12	Contractors unwillingness to help consultants manage project risk					
13	Risk management is time consuming					
14	Risk management is too academic					
15	Risk management is complicated process					
16	No formal risk management framework					
17	Risk management process is intimidating					
18	Risk management consumes financial resources					
19	Risk management is nobody"s business					